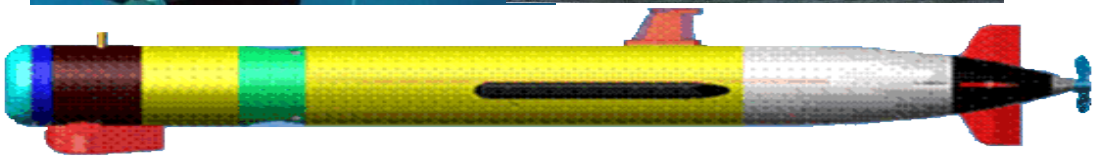
Commander Mine Warfare Command

Status of SMCM UUV Experimentation and UOES



The Impetus

- Traditional Navy Mine Countermeasures (MCM) missions by Surface MCM (SMCM) Platforms
  - **Sequentially, *one mine at a time***
    - Detection / Reacquisition
    - Classification
    - Identification
    - Neutralization
  - Observable
  - Directly exposed to Mine Threat

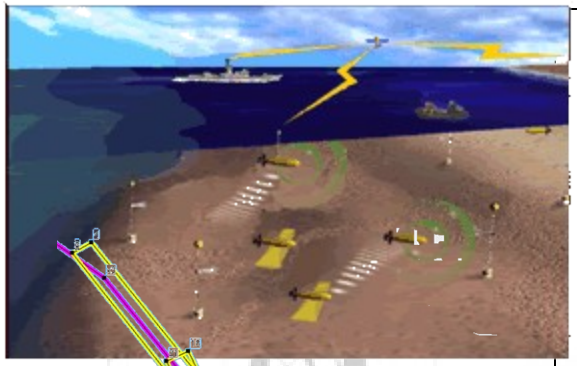
Can ***negatively impact the timetable*** of maritime operations

Expected Yield

- Partial Solution to Capability Gaps
  - Complements other solutions (MCM Tool Kit)
- UUV Contribution is two-part:
  - Capability
    - Buried Mine Detection / Classification
    - Increased Standoff from Ship
    - Environmental Intelligence Preparation of Battlespace (E-IPB)
    - Operational Reach
  - Capacity
    - Detection / Reacquisition
    - Classification
    - Identification
    - Neutralization (future spiral)

Can ***positively impact the timetable*** of maritime operations

SMCM UUV Concept & Objectives



- **Concept**
  - UUV systems complement the basic missions of SMCM with reduced **time** and **risk**
  - IAW the Navy's Mine Warfare Plan, SMCM Forces are focused on two main areas:
    - ***Safe Passage/Transit***
    - ***Amphibious Operations***

- **Objectives**
  - ***Reduce Overall Mission Time***. UUVs will be examined with a goal of achieving greater area coverage rates and reducing MCM timelines.
    - Primary Goal
  - ***Reduce Overall Risk To MCM Forces***. Lessen the need of exposing surface ships to hostile action (mines and enemy counter-attack).
    - Benefit of Program
  - ***Evaluate Interoperability With Other Systems***. Integrate into existing Combat System and C4I architecture; address Human Systems Integration (HSI) issues, integrate into SMCM Detect-to-Engage sequence (Spiral)

SMCM UUV Tasks

- ***Collection of environmental data*** which can be used to enable maritime operations
- ***Rapid area sampling*** of multiple areas to support operating area selection through use of multiple UUVs from multiple host platforms
- ***Detection, classification and localization of mine-like contacts*** in cooperation with existing SMCM sensors
- ***Reacquisition and identification of mine-like contacts*** in cooperation with, or in lieu of, existing SMCM sensors
  - Tethered Mine Neutralization System (MNS)
  - Embarked Explosive Ordnance Disposal dive element
- ***Neutralization of mines*** (future spiral)
- ***Post-neutralization Battle Damage Assessment (BDA)***

Focus of Effort – Platforms

- Avenger Class (MCM-1) is primary
- Osprey Class (MHC-51) contingency
  - Decommissioning proposed FY06/07/08
- Craft of Opportunity (Naval or Other)
- Littoral Combat Ship (LCS)
- Small Boat
- Shore Launch

Experimentation Events

- Phase I: MIREM 27 (MHC Class)
  - Remote Environmental Monitoring UnitS (REMUS) 900 kHz & Sculpin 600/1200 kHz
  - Bahrain
- Phase II: Blue Game (HSV-2 SWIFT)
  - Battlespace Preparation Autonomous Underwater Vehicle (BPAUV)
  - 455 kHz Klein 5400
  - Kristiansand, Norway
- Phase III: CJTFEX (Two Crafts of Opportunity)
  - REMUS Shallow Water 900/1800 kHz & BPAUV
  - Onslow Bay, NC
- Phase IV: Lead Shield II (HSV-2 SWIFT and Shore-Launched)
  - Sculpin 600/1200 kHz
  - Oakland Harbor, CA
- Phase V/VI: GOMEX 05-1 (HSV-2 SWIFT and MCM Class)
  - REMUS SW 900/1800 kHz
  - Panama City OPAREA, FL
- Phase VII: Craft of Opportunity
  - WHOI 12 Small Synthetic Aperture Minehunter (SSAM) & REMUS R-I 900/1800 kHz
  - San Diego, CA
- Phase VIII: AUVFEST (Shore-Launched and Small Boat)
  - WHOI 12, REMUS SW, Bluefin 12, Gavia, MARV, SeaLion
  - Puget Sound, WA

Lessons Learned

- Vehicle reliability
- Communications reliability / de-confliction
- Navigation system calibration time
- Data download & PMA time
- MEDAL integration for mission planning & data transfer
- Interpretation of side-scan sonar data
- Waterproof, reliable acoustic monitoring device
- Emergency submerged vehicle locator (NATO standard)
- Operable with minimal manning
- Easy to read ballasting charts
- Vehicle temperature control onshore
- Operator error in planning
- Continuous display of sonar data during PMA